PB-240 232

FORD LAKE, WASHTENAW COUNTY, MICHIGAN

Pacific Northwest Environmental Research Laboratory

Prepared for:

National Environmental Research Center, Corvallis, Oregon
National Environmental Research Center, Las Vegas, Nevada
Michigan National Guard
Michigan Department of Natural Resources

February 1975

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16. ABSTRACT
Annual total phosphorus and total nitrogen loadings to the lake were estimated and subdivded according to either point or non-point source origin. An assessment of the lake's trophic condition and limiting nutrient is also provided. All data collected by the U.S.E.P.A. National Eutrophication Survey during the one year study of the lake and its tributaries are included in the report.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
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REPORT
ON
FORD LAKE
WASHTENAW COUNTY
MICHIGAN

EPA REGION V

WORKING PAPER NO. 193

WITH THE COOPERATION OF THE

MICHIGAN DEPARTMENT OF NATURAL RESOURCES

AND THE

MICHIGAN NATIONAL GUARD

FEBRUARY, 1975

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FOREWORD

The National Eutrophication Survey was initiated in 1972 in response to an Administration commitment to investigate the nationwide threat of accelerated eutrophication to fresh water lakes and reservoirs.

OBJECTIVES

The Survey was designed to develop, in conjunction with state environmental agencies, information on nutrient sources, concentrations, and impact on selected freshwater lakes as a basis for formulating comprehensive and coordinated national, regional, and state management practices relating to point-source discharge reduction and non-point source pollution abatement in lake watersheds.

ANALYTIC APPROACH

The mathematical and statistical procedures selected for the Survey's eutrophication analysis are based on related concepts that:

a. A generalized representation or model relating sources, concentrations, and impacts can be constructed.

b. By applying measurements of relevant parameters associated with lake degradation, the generalized model can be transformed into an operational representation of a lake, its drainage basin, and related nutrients.

c. With such a transformation, an assessment of the potential for eutrophication control can be made.

LAKE ANALYSIS

In this report, the first stage of evaluation of lake and watershed data collected from the study lake and its drainage basin is documented. The report is formatted to provide state environmental agencies with specific information for basin planning [§303(e)], water quality criteria/standards review [§303(c)], clean lakes [§314(a,b)], and water quality monitoring [§106 and §305(b)] activities mandated by the Federal Water Pollution Control Act Amendments of 1972.

Beyond the single lake analysis, broader based correlations between nutrient concentrations (and loading) and trophic condition are being made to advance the rationale and data base for refinement of nutrient water quality criteria for the Nation's fresh water lakes. Likewise, multivariate evaluations for the relationships between land use, nutrient export, and trophic condition, by lake class or use, are being developed to assist in the formulation of planning guidelines and policies by EPA and to augment plans implementation by the states.

ACKNOWLEDGMENT

The staff of the National Eutrophication Survey (Office of Research & Development, U. S. Environmental Protection Agency) expresses sincere appreciation to the Michigan Department of Natural Resources for professional involvement and to the Michigan National Guard for conducting the tributary sampling phase of the Survey.

A. Gene Gazlay, former Director, and David H. Jenkins, Acting Director, Michigan Department of Natural Resources; and Carlos Fetterolf, Chief Environmental Scientist, and Dennis Tierney, Aquatic Biologist, Bureau of Water Management, Department of Natural Resources, provided invaluable lake documentation and counsel during the course of the Survey. John Vogt, Chief of the Bureau of Environmental Health, Michigan Department of Public Health, and his staff were most helpful in identfying point sources and soliciting municipal participation in the Survey.

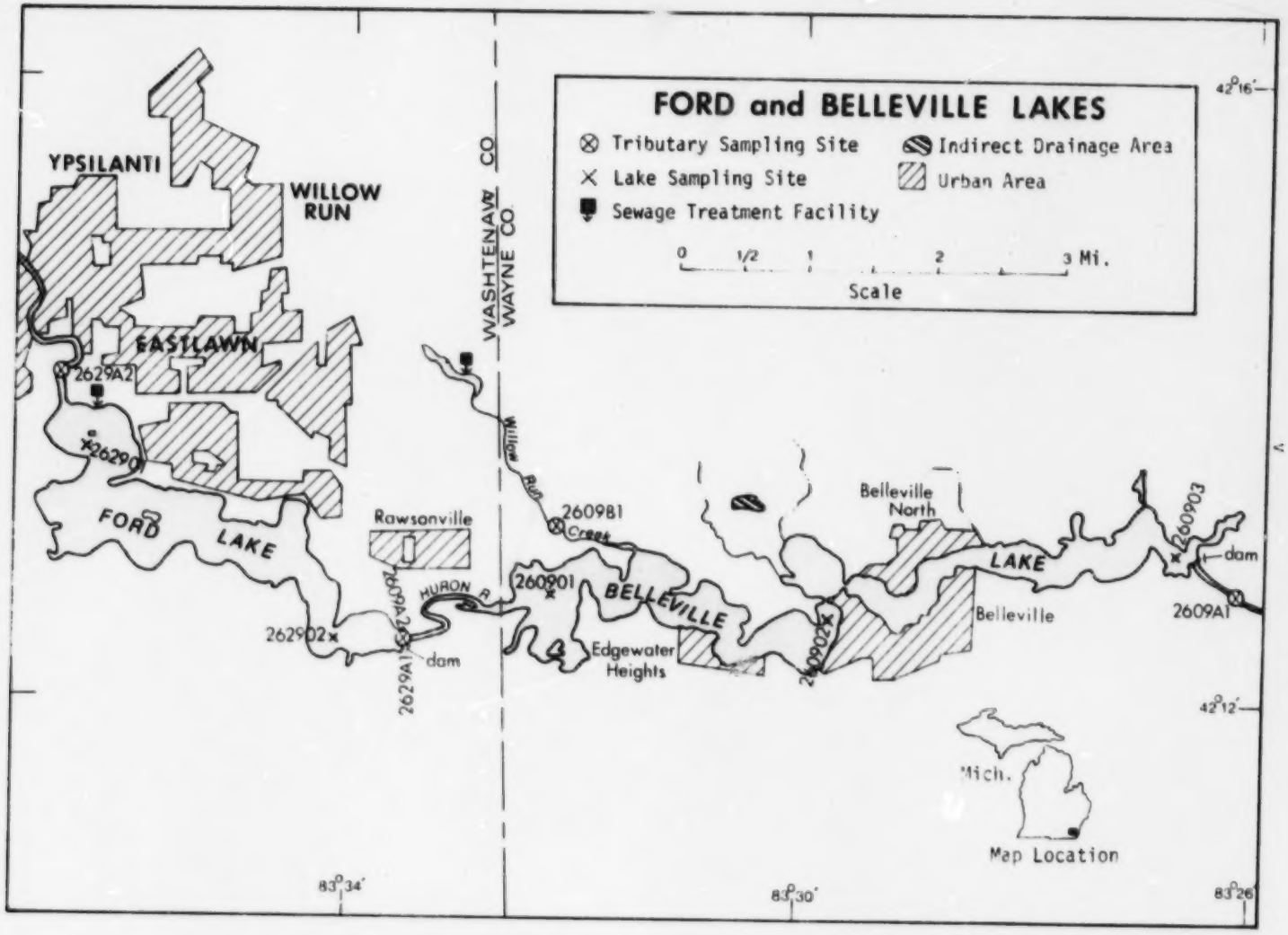
Major General Clarence A. Schnipke (Retired), then the Adjutant General of Michigan, and Project Officer Colonel Albert W. Lesky, who directed the volunteer efforts of the Michigan National Guardsmen, are also gratefully acknowledged for their assistance to the Survey.

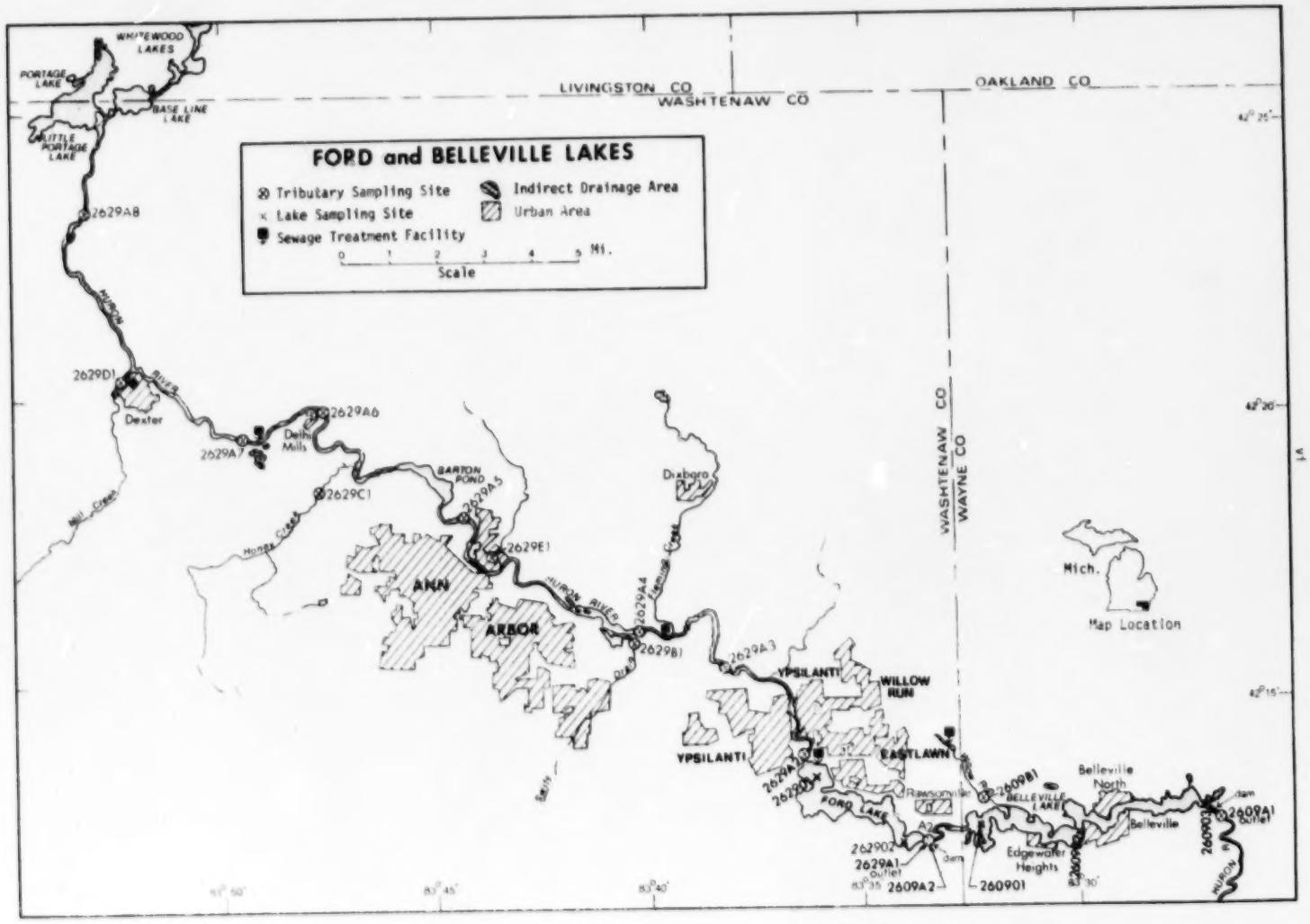
NATIONAL EUTROPHICATION SURVEY

STUDY LAKES

STATE OF MICHIGAN

LAKE NAME	COUNTY
Allegan Res.	Allegan
Barton	Kalamazoo
Belleville	Wayne
Betsie	Benzie
Brighton	Livingston
Caro Res.	Tuscola
Charlevoix	Charlevoix
Chemung	Livingston
Constantine Res.	St. Joseph
Crystal	Montcalm
Deer	Marquette
Ford	Washtenaw
Fremont	Newago
Higgins	Roscommon
Holloway Res.	Genesee, Lapeer
Houghton	Roscommon
Jordon	Ionia, Barry
Kent	Oakland
Long	St. Joseph
Macatawa	Ottawa
Manistee	Manistee
Mona	Muskegon
Muskegon	Muskegon
Pentwater	Oceana
Pere Marquette	Mason
Portage	Houghton
Randall	Branch
Rogers Pond	Mecosta
Ross	Gladwin
St. Louis Res.	Gratiot
Sanford	Midland
Strawberry	Livingston
Thompson	Livingston
Thornapple	Barry
Union	Branch
White	Muskegon


FORD and BELLEVILLE LAKES
Tributary Sampling Site
Lake Sampling Site
Sewage Treatment Facility
Indirect Drainage Area
Urban Area
0 1/2 1 2 3 Mi.
Scale
YPSILANTI
WILLOW RUN
EASTLAWN
WASHTENAW CO
WAYNE CO
2629A2
262902
FORD LAKE
Rawsonville
HURON R
2629A1
dam
260981
Creek
260901
BELLEVILLE LAKE
Belleville North
Belleville
Edgewater Heights
260903
2609A1
dam
42°16'
42°12'
83°34'
83°30'
83°26'
Mich.
Map Location


FORD and BELLEVILLE LAKES
Tributary Sampling Site
Lake Sampling Site
Sewage Treatment Facility
Indirect Drainage Area
Urban Area
0 1 2 3 4 5 Mi.
Scale
LIVINGSTON CO
WASHTENAW CO
OAKLAND CO
WAYNE CO
WHITEWOOD LAKES
PORTAGE LAKE
BASE LINE LAKE
LITTLE PORTAGE LAKE
2629A8
HURON RIVER
2629D1
Dexter
Delhi Mills
2629A6
2629A7
2629C1
BARTON POND
2629A5
Mill Creek
HONEY CREEK
2629E1
ANN ARBOR
HURON RIVER
2629A4
Traverse Creek
Dixboro
2629B1
2629A3
YPSILANTI
WILLOW RUN
EASTLAWN
YPSILANTI
2629A2
2629B1
FORD LAKE
Ypsilanti
Belleville North
BELLEVILLE LAKE
Belleville
Edgewater Heights
2629A1 Outlet
2629A2
260901
260902
Mich.
Map Location

FORD LAKE

STORET NO. 2629

I. CONCLUSIONS

A. Trophic Condition:

Survey data and the records of others (Ketelle and Uttormark, 1971) indicate that Ford Lake is eutrophic. Near depletion of dissolved oxygen occurred at the 25-foot depth at station 2 in June, and Survey limnologists noted a widespread blue-green algal bloom during the September sampling.

Of the 35 Michigan lakes sampled in November when essentially all were well-mixed, 22 had less mean total phosphorus, 24 had less mean dissolved phosphorus, and 30 had less mean inorganic nitrogen; of all 41 Michigan lakes sampled, 25 had less mean chlorophyll a, and 26 had greater Secchi disc transparency*.

B. Rate-Limiting Nutrient:

A significant loss of phosphorus occurred in the algal assay sample between the time of collection and the beginning of the assay, and the results are not representative of conditions in the lake at the time the sample was taken. However, the lake data show phosphorus to be limiting in September and November and nitrogen to be limiting in June.

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* See Appendix A.

C. Nutrient Controllability:

1. Point sources--During the sampling year, Ford Lake received a total phosphorus load at a rate about eight times the rate proposed by Vollenweider (in press) as "dangerous"; i.e., a eutrophic rate (see page 13). Now, Ford Lake has a rather short hydraulic retention time of 15 days, and Vollenweider's model may not be applicable. Nonetheless, the existing trophic condition of the lake is evidence of excessive nutrient loads.

It is calculated that the municipal waste treatment plants included in this study contributed about 92% of the total phosphorus load. The Ann Arbor plant, with phosphorus removal, contributed about 42% of the total load, and the remaining three plants (Ypsilanti, Scio-Webster, and Dexter) contributed a little over 50%. Removal of 85% of the phosphorus at the three municipal point sources now without phosphorus control would reduce the loading rate to 9.26 $g/m^2/yr$ or less than five times the eutrophic rate.

Considering the questionable applicability of Vollenweider's model, it is likely that the degree of phosphorus removal noted above would improve the trophic condition of Ford Lake and, in particular, would reduce the incidence and severity of nuisance algal blooms. Also, downstream Belleville Lake* would benefit

* Working Paper No. 184.

from phosphorus control since only 19% of the phosphorus load to Ford Lake is retained in the lake; i.e., about 81% of the point-source load to Ford Lake impacts Belleville Lake as well.

2. Non-point sources--It is estimated that non-point sources, including precipitation, contributed 7.5% of the total phosphorus load during the sampling year.

The phosphorus export of the Huron River was quite low as compared to other Michigan streams sampled during the Survey year (see page 13).

II. LAKE AND DRAINAGE BASIN CHARACTERISTICS

A. Lake Morphometry†:

1. Surface area: 1,050 acres.
2. Mean depth: 14.3 feet.
3. Maximum depth: 39 feet.
4. Volume: 15,015 acre-feet.
5. Mean hydraulic retention time: 15 days.

B. Tributary and Outlet:
(See Appendix B for flow data)

1. Tributaries -

Name	Drainage area*	Mean flow*
Huron River	809.0 mi^2	494.9 cfs
Minor tributaries & immediate drainage -	3.4 mi^2	2.8 cfs
Totals	812.4 mi^2	497.7 cfs

2. Outlet -

Huron River	814.0 mi^2**	497.7 cfs

C. Precipitation***:

1. Year of sampling: 40.6 inches.
2. Mean annual: 39.9 inches.

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† Fetterolf, 1973.
* Drainage areas are accurate within ±5%; mean daily flows for 74% of the sampling sites are accurate within ±25% and the remaining sites up to ±40%; and mean monthly flows, normalized mean monthly flows, and mean annual flows are slightly more accurate than mean daily flows.
** Includes area of lake.
*** See Working Paper No. 1, "Survey Methods, 1972".

III. LAKE WATER QUALITY SUMMARY

Ford Lake was sampled three times during the open-water season of 1972 by means of a pontoon-equipped Huey helicopter. Each time, samples for physical and chemical parameters were collected from two stations on the lake and from a number of depths at each station (see map, page v). During each visit a single depth-integrated (15 feet to surface) sample was composited from the two stations for phytoplankton identification and enumeration; and during the second visit, a single five-gallon depth-integrated sample was composited for algal assays. Also each time, a depth-integrated sample was collected from each of the stations for chlorophyll a analyses. The maximum depths sampled were 15 feet at station 1, and 25 feet at station 2.

The results obtained are presented in full in Appendix C, and the data for the fall sampling period, when the lake was essentially well-mixed, are summarized below. Note, however, the Secchi disc summary is based on all values.

For differences in the various parameters at the other sampling times, refer to Appendix C.

A. Physical and chemical characteristics:

FALL VALUES

(11/13/72)

Parameter	Minimum	Mean	Median	Maximum
Temperature (Cent.)	7.5	7.5	7.6	7.7
Dissolved oxygen (mg/l)	8.6	9.4	9.0	11.0
Conductivity (μmhos)	510	524	520	550
pH (units)	8.1	8.1	8.1	8.2
Alkalinity (mg/l)	193	196	195	202
Total P (mg/l)	0.077	0.105	0.110	0.118
Dissolved P (mg/l)	0.050	0.058	0.060	0.062
NO_2 + NO_3 (mg/l)	0.570	0.702	0.570	1.220
Ammonia (mg/l)	0.710	0.834	0.860	0.900

ALL VALUES

Secchi disc (inches)	21	44	44	64

B. Biological characteristics:

1. Phytoplankton -

Sampling Date	Dominant Genera	Number per ml
06/16/72	1. Oocystis	1,501
	2. Schroederia	1,302
	3. Dinobryon	741
	4. Cocconeis	434
	5. Cryptomonas	416
	Other genera	1,013
	Total	5,407
09/19/72	1. Anabaena	2,981
	2. Flagellates	1,660
	3. Lyngbya	1,132
	4. Stephanodiscus	566
	5. Cryptomonas	415
	Other genera	2,680
	Total	9,434
11/13/72	1. Cyclotella	275
	2. Stephanodiscus	166
	3. Melosira	137
	4. Navicula	137
	5. Raphidiopsis	137
	Other genera	804
	Total	1,656

2. Chlorophyll a -
(Because of instrumentation problems during the 1972 sampling, the following values may be in error by plus or minus 20 percent.)

Sampling Date	Station Number	Chlorophyll a (µg/l)
06/16/72	01	16.2
	02	26.5
09/19/72	01	6.4
	02	5.0
11/13/72	01	2.6
	02	31.7

C. Limiting Nutrient Study:

A 31% loss of phosphorus occurred in the algal assay sample between the time of collection and the beginning of the assay, and the results are not indicative of conditions in the lake at the time of sampling.

The lake data indicate phosphorus limitation in September (N/P ratio was 15/1) and November (N/P = 26/1) but nitrogen limitation in June (N/P = 9/1).

IV. NUTRIENT LOADINGS
(See Appendix D for data)

For the determination of nutrient loadings, the Michigan National Guard collected monthly near-surface grab samples from each of the tributary sites indicated on the map (page vi), except for the high runoff months of March, April, and December, when two samples were collected from station A-1; two samples were collected from station A-2 during April and December. Sampling was begun in October, 1972, and was completed in September, 1973.

Through an interagency agreement, stream flow estimates for the year of sampling and a "normalized" or average year were provided by the Michigan District Office of the U.S. Geological Survey for the tributary sites nearest the lake.

In this report, nutrient loads for sampled tributaries were determined by using a modification of a U.S. Geological Survey computer program for calculating stream loadings*. The nutrient loads given for the Huron River are those measured at station A-2 minus the upstream point sources.

Nutrient loadings for unsampled "minor tributaries and immediate drainage" ("ZZ" of U.S.G.S.) were estimated by using the means of the nutrient concentrations in Mill Creek at station D-1 and multiplying by the mean ZZ flow.

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* See Working Paper No. 1.

The operators of the Ann Arbor, Dexter, Scio-Webster, and Ypsilanti wastewater treatment plants provided effluent samples and corresponding flow data.

A. Waste Sources:

1. Known Municipal* -

Name	Pop. Served	Treatment	Mean Flow (mgd)	Receiving Water
Ann Arbor	100,000	act. sludge + P-removal	16.477	Huron River
Dexter	1,700	prim. clarifier	0.235	Mill Creek
Scio-Webster	500	trickling filter	0.088	Huron River
Ypsilanti	21,000	act. sludge	7.120	Ford Lake

2. Industrial - Unknown

* Sprow, 1974.

B. Annual Total Phosphorus Loading - Average Year:

1. Inputs -

Source	lbs P/ yr	% of total
a. Tributaries (non-point load) -		
Huron River	10,940	7.2
b. Minor tributaries & immediate drainage (non-point load) -	390	0.3
c. Known municipal STP's -		
Ann Arbor	63,790	42.1
Dexter	7,090	4.7
Scio-Webster	1,160	0.8
Ypsilanti	67,930	44.8
d. Septic tanks - Unknown	-	-
e. Industrial - Unknown	-	-
f. Direct precipitation* -	160	0.1
Total	151,460	100.0

2. Outputs -

Lake outlet - Huron River 122,780

3. Net annual P accumulation - 28,680 pounds

* See Working Paper No. 1.

C. Annual Total Nitrogen Loading - Average Year:

1. Inputs -

Source	lbs N/ yr	% of total
a. Tributaries (non-point load) -		
Huron River	1,475,530	59.9
b. Minor tributaries & immediate drainage (non-point load) -	16,360	0.7
c. Known municipal STP's -		
Ann Arbor	780,380	31.7
Dexter	26,710	1.1
Scio-Webster	3,260	0.1
Ypsilanti	151,490	6.1
d. Septic tanks - Unknown	-	-
e. Industrial - Unknown	-	-
f. Direct precipitation* -	10,120	0.4
Total	2,463,850	100.0

2. Outputs -

Lake outlet - Huron River 2,167,580

3. Net annual N accumulation - 296,270 pounds

* See Working Paper No. 1.

D. Mean Annual Non-point Nutrient Export by Subdrainage Area:

Tributary	lbs P/mi^2/yr	lbs N/mi^2/yr
Huron River	14	1,824

E. Yearly Loading Rates:

In the following table, the existing phosphorus loading rates are compared to those proposed by Vollenweider (in press). Essentially, his "dangerous" rate is the rate at which the receiving waters would become eutrophic or remain eutrophic; his "permissible" rate is that which would result in the receiving water remaining oligotrophic or becoming oligotrophic if morphometry permitted. A mesotrophic rate would be considered one between "dangerous" and "permissible".

Note that Vollenweider's model may not be applicable to water bodies with very short hydraulic retention times.

	Total Phosphorus		Total Nitrogen	
Units	Total	Accumulated	Total	Accumulated
lbs/acre/yr	144.2	27.3	2,346.5	282.2
grams/m^2/yr	16.17	3.06	263.0	31.6

Vollenweider loading rates for phosphorus (g/m^2/yr) based on mean depth and mean hydraulic retention time of Ford Lake:

"Dangerous" (eutrophic rate)	1.96
"Permissible" (oligotrophic rate)	0.98

V. LITERATURE REVIEWED

Fetterolf, Carlos, 1972. Personal communication (lake morphometry). MI Dept. of Nat. Resources, Lansing.

Ketelle, Martha J., and Paul D. Uttormark, 1971. Problem lakes of the United States. EPA Water Poll. Contr. Res. Ser., Proj. #16010 EHR.

Sprow, David L., 1974. Personal communication (wastewater treatment plants). MI Dept. Publ. Health, Lansing.

Vollenweider, Richard A. (in press). Input-output models. Schweiz. Z. Hydrol.

VI. APPENDICES

APPENDIX A

LAKE RANKINGS

LAKE DATA TO BE USED IN RANKINGS

LAKE CODE	LAKE NAME	FALL VALUES MEAN TOTAL P	FALL VALUES MEAN DISS P	FALL VALUES MEAN INORG N	ALL VALUES 500-MEAN SEC	ALL VALUES MEAN CHLORA	ALL VALUES 15-MIN UD
2640	HOLLOWAY RESERVOIR	0.062	0.043	1.461	439.375	10.676	9.200
2641	CARO RESERVOIR	0.117	0.022	3.035	473.000	11.967	9.500
2647	BOARDMAN HYDRO POND	0.006	0.005	0.358	363.500	1.267	6.600
2683	ALLEGAN LAKE	0.123	0.057	1.168	470.222	20.311	12.600
2686	BARTON LAKE	0.121	0.086	1.489	456.167	27.880	14.850
2689	BELLEVILLE LAKE	0.118	0.048	1.428	462.250	28.262	8.200
2610	BETSIE LAKE	0.025	0.008	0.273	481.667	4.567	7.400
2613	BRIGHTON LAKE	0.109	0.073	1.015	456.000	44.233	7.500
2617	LAKE CHARLEVOIX	0.007	0.004	0.230	351.250	3.088	9.240
2618	LAKE CHEMUNG	0.044	0.014	0.132	404.333	13.483	14.800
2621	CONSTANTINE RESERVOIR	0.027	0.008	0.910	456.167	39.317	7.500
2629	FORD LAKE	0.105	0.058	1.536	456.167	14.733	14.000
2631	FREMONT LAKE	0.372	0.342	1.406	441.667	28.500	14.800
2640	JORDAN LAKE	0.188	0.144	1.998	427.667	20.517	14.900
2643	KENT LAKE	0.040	0.015	0.417	455.800	33.944	13.000
2648	LAKE MACATAWA	0.197	0.128	2.358	477.600	25.600	12.200
2649	MANISTEE LAKE	0.018	0.010	0.304	451.333	6.317	11.340
2659	MUSKEGON LAKE	0.087	0.043	0.469	436.444	9.511	14.600
2665	PENTWATER LAKE	0.027	0.017	0.496	438.667	16.083	14.800
2671	RANDALL LAKE	0.246	0.183	0.810	457.333	27.217	8.020
2672	ROGERS POND	0.026	0.015	0.183	435.500	8.133	9.600
2673	RUSS RESERVOIR	0.034	0.021	0.460	465.333	10.383	8.200
2674	SANFORD LAKE	0.016	0.008	0.307	458.750	13.791	8.300
2683	THORNAPPLE LAKE	0.042	0.032	1.737	442.833	14.650	10.800
2685	UNION LAKE	0.083	0.064	1.252	455.500	15.667	8.200
2688	WHITE LAKE	0.027	0.019	0.367	417.778	9.211	13.400
2691	MONA LAKE	0.307	0.241	0.963	451.667	27.783	14.100
2692	LONG LAKE	0.163	0.148	0.749	418.400	10.067	13.000

LAKE DATA TO BE USED IN RANKINGS

LAKE CODE	LAKE NAME	FALL VALUES: MEAN TOTAL P	FALL VALUES: MEAN DISS P	FALL VALUES: MEAN INORG N	ALL VALUES: 500- MEAN SEC	ALL VALUES: MEAN CHLORA	ALL VALUES: 15- MIN DO
2693	ST LOUIS RESERVOIR	0.134	0.093	1.227	462.667	5.583	8.420
2694	CRYSTAL LAKE	0.009	0.006	0.164	380.000	2.986	13.000
2695	HIGGINS LAKE	0.007	0.005	0.058	268.500	1.043	9.400
2696	HOUGHTON LAKE	0.018	0.008	0.136	420.833	9.217	8.200
2697	THOMPSON LAKE	0.043	0.029	0.436	407.889	11.967	14.800
2698	PERE MARQUETTE LAKE	0.032	0.024	0.346	448.667	11.833	8.600
2699	STRAWBERRY LAKE	0.069	0.050	0.567	419.800	11.117	13.600

PERCENT OF LAKES WITH HIGHER VALUES (NUMBER OF LAKES WITH HIGHER VALUES)

LAKE CODE	LAKE NAME	FALL VALUES: MEAN TOTAL P	FALL VALUES: MEAN DISS P	FALL VALUES: MEAN INORG N	ALL VALUES: SUM- MEAN SEC	ALL VALUES: MEAN CHLORA	ALL VALUES: 1S- MIN DO	INDEX NO
26A0	HOLLOWAY RESERVOIR	46 (16)	43 (15)	17 (6)	57 (20)	60 (21)	63 (22)	286
26A1	CARO RESERVOIR	29 (10)	54 (19)	0 (0)	3 (1)	49 (17)	54 (19)	189
26A2	BOARDMAN HYDRO POND	97 (34)	97 (34)	69 (24)	91 (32)	94 (33)	97 (34)	545
2603	ALLEGAN LAKE	20 (7)	31 (11)	31 (11)	6 (2)	29 (10)	40 (14)	157
2606	BARTON LAKE	23 (8)	20 (7)	14 (5)	29 (9)	14 (5)	3 (1)	103
2609	BELLEVILLE LAKE	26 (9)	37 (13)	20 (7)	11 (4)	11 (4)	79 (26)	184
2610	BETSIE LAKE	77 (27)	77 (27)	80 (28)	17 (6)	86 (30)	94 (33)	431
2613	BRIGHTON LAKE	31 (11)	23 (8)	34 (12)	34 (12)	0 (0)	90 (31)	212
2617	LAKE CHARLEVOIX	91 (32)	91 (32)	83 (29)	94 (33)	89 (31)	60 (21)	508
2618	LAKE CHEMUNG	49 (17)	71 (25)	94 (33)	86 (30)	46 (16)	11 (2)	357
2621	CONSTANTINE RESERVOIR	71 (25)	83 (29)	40 (14)	29 (9)	3 (1)	90 (31)	316
2629	FORD LAKE	34 (12)	29 (10)	11 (4)	29 (9)	37 (13)	23 (8)	163
2631	FREMONT LAKE	0 (0)	0 (0)	23 (8)	54 (19)	9 (3)	11 (2)	97
2640	JORDAN LAKE	11 (4)	11 (4)	6 (2)	69 (24)	26 (9)	0 (0)	123
2643	KENT LAKE	57 (20)	69 (24)	63 (22)	40 (14)	6 (2)	36 (12)	271
2648	LAKE MACATAWA	9 (3)	14 (5)	3 (1)	0 (0)	23 (8)	43 (15)	92
2649	MANISTEE LAKE	80 (28)	74 (26)	77 (27)	46 (16)	80 (28)	46 (16)	403
2659	MUSKEGON LAKE	37 (13)	40 (14)	54 (19)	60 (21)	69 (24)	11 (2)	271
2665	PENTWATER LAKE	69 (24)	63 (22)	51 (18)	66 (23)	31 (11)	11 (2)	291
2671	RANDALL LAKE	6 (2)	6 (2)	43 (15)	23 (8)	20 (7)	86 (30)	184
2672	ROGERS POND	74 (26)	66 (23)	86 (30)	63 (22)	77 (27)	51 (18)	417
2673	ROSS RESERVOIR	60 (21)	57 (20)	57 (20)	9 (3)	63 (22)	79 (26)	325
2674	SANFORD LAKE	86 (30)	80 (28)	74 (26)	20 (7)	43 (15)	71 (25)	374
2683	THORNAPPLE LAKE	54 (19)	46 (16)	9 (3)	51 (18)	40 (14)	49 (17)	249
2685	UNION LAKE	40 (14)	26 (9)	26 (9)	37 (13)	34 (12)	79 (26)	242
2688	WHITE LAKE	66 (23)	60 (21)	66 (23)	80 (28)	74 (26)	31 (11)	377
2691	MONA LAKE	3 (1)	3 (1)	37 (13)	43 (15)	17 (6)	20 (7)	123
2692	LONG LAKE	14 (5)	9 (3)	46 (16)	77 (27)	66 (23)	27 (9)	239

PERCENT OF LAKES WITH HIGHER VALUES (NUMBER OF LAKES WITH HIGHER VALUES)

LAKE CODE	LAKE NAME	FALL VALUES: MEAN TOTAL P	FALL VALUES: MEAN DISS P	FALL VALUES: MEAN INORG N	ALL VALUES: 500-MEAN SEC	ALL VALUES: MEAN CHLORA	ALL VALUES: 15-MIN DO	INDEX NO
2693	ST LOUIS RESERVOIR	17 (6)	17 (6)	29 (10)	14 (5)	83 (29)	69 (24)	229
2694	CRYSTAL LAKE	89 (31)	89 (31)	89 (31)	89 (31)	91 (32)	36 (12)	483
2695	HIGGINS LAKE	94 (33)	94 (33)	97 (34)	97 (34)	97 (34)	57 (20)	536
2696	HOUGHTON LAKE	83 (29)	86 (30)	91 (32)	71 (25)	71 (25)	79 (26)	481
2697	THOMPSON LAKE	51 (18)	49 (17)	60 (21)	83 (29)	51 (18)	11 (2)	305
2698	PERE MARQUETTE LAKE	63 (22)	51 (18)	71 (25)	49 (17)	54 (19)	66 (23)	354
2699	STRAWBERRY LAKE	43 (15)	34 (12)	49 (17)	74 (26)	57 (20)	27 (9)	284

APPENDIX B

TRIBUTARY FLOW DATA

TRIBUTARY FLOW INFORMATION FOR MICHIGAN 2/3/75

LAKE CODE 2629 FORD LAKE

TOTAL DRAINAGE AREA OF LAKE(SQ MI) 814.00

TRIBUTARY	SUB-DRAINAGE AREA(SQ MI)	NORMALIZED FLOWS(CFS) JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN
2629A1	814.00	537.00	629.00	963.00	977.00	678.00	386.00	252.00	185.00	205.00	285.00	406.00	482.00	497.74
2629A2	809.00	477.99	606.02	996.90	1022.13	707.38	441.71	244.26	177.11	216.59	267.81	365.96	427.85	494.90
2629ZZ	5.00	2.80	3.50	5.70	5.90	4.10	2.50	1.40	1.00	1.20	1.50	2.10	2.50	2.84

SUMMARY

TOTAL DRAINAGE AREA OF LAKE = 814.00
SUM OF SUB-DRAINAGE AREAS = 814.00

TOTAL FLOW IN = 5985.89
TOTAL FLOW OUT = 5985.00

MEAN MONTHLY FLOWS AND DAILY FLOWS(CFS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
2629A1	10	72	324.00	28	600.00				
	11	72	689.00	24	703.00				
	12	72	734.00	16	724.00				
	1	73	1120.00	13	785.00				
	2	73	648.00	10	793.00				
	3	73	1540.00	11	1490.00	25	2030.00		
	4	73	1160.00	15	883.00	30	528.00		
	5	73	867.00	31	1260.00				
	6	73	808.00	26	515.00				
	7	73	602.00	24	363.00				
	8	73	508.00	28	282.00				
	9	73	238.00	27	166.00				
2629A2	10	72	322.00	28	596.00				
	11	72	685.00						
	12	72	729.00	2	629.00	16	719.00		
	1	73	1110.00	13	781.00				
	2	73	644.00	10	789.00				
	3	73	1540.00	11	1480.00				
	4	73	1150.00	15	877.00	25	1220.00		
	5	73	861.00	31	1250.00				
	6	73	803.00	26	512.00				
	7	73	599.00	24	361.00				
	8	73	505.00	28	280.00				
	9	73	237.00	27	165.00				
2629ZZ	10	72	2.00						
	11	72	4.20						
	12	72	4.50						
	1	73	6.80						
	2	73	4.00						
	3	73	9.40						
	4	73	7.10						
	5	73	5.30						
	6	73	4.90						
	7	73	3.70						
	8	73	3.10						
	9	73	1.50						

APPENDIX C

PHYSICAL and CHEMICAL DATA

STORET RETRIEVAL DATE 75/02/04

262901
42 13 30.0 083 36 30.0
FORD LAKE
26 MICHIGAN

11EPALES
4

2111202
0020 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00630 NO2&NO3 N-TOTAL MG/L	00610 NH3-N TOTAL MG/L	00665 PHOS-TOT MG/L P	00666 PHOS-DIS MG/L P
72/06/16	18 05	0000	22.4	10.6	54	530	6.29	190	0.450	0.440	0.113	0.087
	18 05	0015	21.0	6.0		535	7.91	191	0.420	0.630	0.142	0.108
72/09/19	09 30	0000			21	540	7.45	162	0.710	0.900	0.158	0.107
	09 30	0004	21.3	6.0		540	7.55	160	0.740	0.800	0.161	0.106
72/11/13	12 25	0000	7.5	11.0	38	550	8.20	202	1.220	0.710	0.077	0.050

DATE FROM TO	TIME OF DAY	DEPTH FEET	32217 CHLRPHYL A UG/L
72/06/16	18 05	0000	16.2J
72/09/19	09 30	0000	6.4J
72/11/13	12 25	0000	2.6J

J VALUE KNOWN TO BE IN ERROR

STORET RETRIEVAL DATE 75/02/04

262902
42 12 30.0 083 34 30.0
FORD LAKE
26 MICHIGAN

11EPALES
4

2111202
0028 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00630 NO2&NO3 N-TOTAL MG/L	00610 NH3-N TOTAL MG/L	00665 PHOS-TOT MG/L P	00666 PHOS-DIS MG/L P
72/06/16	18	20 0000	22.8	9.0	64	580	8.32	183	0.280	0.300	0.099	0.070
	18	20 0015	22.7	9.0		520	8.23	182	0.280	0.340	0.094	0.065
	18	20 0025	20.2	1.0		515	7.58	197	0.320	0.940	0.172	0.136
72/09/19	10	00 0000			50	560	8.18	144	0.370	0.230	0.071	0.047
	10	00 0004	22.0	8.9		560	8.20	143	0.370	0.230	0.072	0.046
	10	00 0015	21.9	8.4		555	8.18	144	0.380	0.240	0.063	0.040
	10	00 0025	21.3	4.2		565	7.68	148	0.340	0.720	0.112	0.069
72/11/13	12	00 0000			36	510	8.10	194	0.580	0.840	0.110	0.061
	12	00 0004	7.7	9.2		520	8.10	193	0.570	0.860	0.115	0.060
	12	00 0015	7.7	8.8		520	8.10	195	0.570	0.900	0.107	0.062
	12	00 0020	7.6	8.6		520	8.10	195	0.570	0.860	0.118	0.059

DATE FROM TO	TIME OF DAY	DEPTH FEET	32217 CHLRPHYL A UG/L
72/06/16	18	20 0000	26.5J
72/09/19	10	00 0000	5.0J
72/11/13	12	00 0000	31.7J

J VALUE KNOWN TO BE IN ERROR

APPENDIX D

TRIBUTARY and WASTEWATER TREATMENT PLANT DATA

STORET RETRIEVAL DATE 75/02/04

2629A2 LS2629A2
42 14 00.0 083 36 00.0
HURON RIVER
26 7.5 YPSILANTI E
I/FORD LAKE (RESERVOIR)
SPRING AVE BRDG SE OF YPSILANTI
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/10/28	14	05	0.650	1.500	0.680	0.025	0.070
73/01/13	14	40	0.810	2.400	0.336	0.027	0.060
73/02/10	13	15	0.820	1.365	0.315	0.025	0.060
73/03/11	09	30	0.900	3.500	0.252	0.031	0.110
73/04/15	12	15	0.380	1.100	0.240	0.015	0.045
73/04/25	15	43	0.810	0.920	0.140	0.013	0.055
73/04/30	11	28	0.340	2.300	0.425	0.014	0.105
73/05/31	11	00	0.520	1.800	0.178	0.037	0.067
73/06/26	11	30	0.520	1.050	0.147	0.095	0.140
73/07/24	18	49	0.750	1.380	0.058	0.078	0.110
73/08/28	18	47	0.590	1.380	0.100	0.046	0.090
73/09/27	09	32	0.570	1.000	0.280	0.039	0.075

STORET RETRIEVAL DATE 75/02/04

2629A3 LS2629A3
42 15 30.0 083 36 30.0
HURON RIVER
26 7.5 ANN ARBOR E
T/FORD LAKE (RESERVOIR)
SUPERIOR RD BRDG N YPSILANTI BELO STP
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/10/28	13 35		0.390	1.450	0.480	0.022	0.063
72/11/24	10 15		0.940	1.100	0.143	0.034	0.065
73/02/10	13 43		0.770	1.250	0.300	0.014	0.050
73/03/11	09 30		0.930	3.300	0.420	0.023	0.120
73/04/15	13 00		0.360	1.150	0.240	0.010	0.040
73/04/25	15 27		0.810	1.000	0.100	0.013	0.050
73/04/30	11 14		0.273	1.380	0.340	0.015	0.065
73/05/31	10 45		0.490	3.300	0.240	0.039	0.065
73/06/26	11 07		0.357	1.320	0.370	0.084	0.140
73/06/28	14 30		0.357	1.400	0.250	0.044	0.102

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STORET RETRIEVAL DATE 73/02/04

2629A4 L52629A4
42 16 30.0 083 40 30.0
HURON RIVER
26 7.5 ANN ARBOR E
T/FORD LAKE (RESERVOIR)
DIXEBORO BRDG E US 23 ABOV YPSILANTI STP
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/10/28	13 25		0.260	1.750	0.108	0.020	0.069
72/12/16	14 32		1.120	1.400	0.150	0.024	0.058
73/01/13	13 30		0.660	2.440	0.270	0.021	0.050
73/02/10	13 32		0.660	0.840	0.048	0.013	0.080
73/03/11	09 30		0.850	2.700	0.700	0.015	0.080
73/04/15	12 45		0.330	0.750	0.027	0.006	0.025
73/04/25	15 20		0.780	0.970	0.023	0.011	0.035
73/04/30	11 20		0.230	1.000	0.025	0.005K	0.040
73/05/31	10 35		0.340	1.150	0.126	0.021	0.050
73/06/26	10 52		0.138	0.860	0.048	0.027	0.055
73/07/24	18 25		0.084	0.840	0.011	0.017	0.050
73/08/28	18 18		0.013	1.470	0.046	0.005K	0.060
73/09/27	09 15		0.095	1.000	0.089	0.016	0.060

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 75/02/04

2627A5 L32629A5
42 18 00.0 083 45 00.0
HURON RIVER
26 I.5 ANN ARBOR E
T/FORD LAKE (RESERVOIR)
WHITMORE LAKE RD BRDG EDGE OF ANN ARBOR
11EMALES 21112U4
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/10/28	12 23		0.320	1.000	0.150	0.025	0.036
72/12/18	15 19		1.100	2.400	0.215	0.019	0.042
73/01/13	12 25		0.630	0.950	0.490	0.018	0.035
73/02/10	12 55		0.650	0.850	0.080	0.011	0.035
73/03/11	08 45		0.840	3.100	0.390	0.016	0.040
73/04/15	12 10		0.357	0.820	0.022	0.006	0.025
73/04/25	14 52		0.800	1.050	0.028	0.009	0.030
73/04/30	10 30		0.240	0.780	0.015	0.005K	0.035
73/05/31	10 08		0.330	1.210	0.090	0.018	0.040
73/06/26	10 19		0.140	0.790	0.056	0.020	0.035
73/07/24	17 55		0.240	1.200	0.026	0.090	0.145
73/09/24	17 38		0.010K	1.400	0.031	0.005K	0.045

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 75/02/04

2626A6 L52626A6
42 20 00.0 083 46 30.0
HURON RIVER
26 7.5 ANN ARBOR W
1/FORD LAKE (RESERVOIR)
BRDG N OF DELMI BELOW SCIO-WEBSTER STP
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/10/28	09 00		0.234	0.450	0.198	0.048	0.088
72/11/24	08 50		0.875	3.400	0.290	0.036	0.063
73/01/13	13 40		0.630	3.000	0.220	0.019	0.040
73/02/10	15 00		0.610	0.750	0.073	0.014	0.040
73/03/11	10 45		0.790	1.500	0.074	0.015	0.050
73/04/15	12 35		0.350	0.756	0.060	0.008	0.035
73/04/25	14 00		0.870	1.380	0.052	0.011	0.035
73/04/30	08 41		0.252	0.680	0.019	0.007	0.035
73/05/31	08 55		0.420	1.600	0.320	0.023	0.060
73/07/24	17 11		0.085	1.000	0.007	0.015	0.050
73/08/29	16 56		0.110	0.655	0.021	0.013	0.035
73/09/27	09 54		0.150	1.000	0.058	0.023	0.050

STORET RETRIEVAL DATE 75/02/04

2529A7 LS2629A7
42 19 00.0 083 50 30.0
HURON RIVER
26 7.5 ANN ARBOR W
1/FORD LAKE (RESERVOIR)
DRUG WSW DELMI ABOV SCIO-WEBSTER STP
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/10/28	09 00		0.210	1.250	0.270	0.052	0.092
72/11/24	08 55		0.855	4.700	0.270	0.035	0.053
73/01/13	13 20		0.600	1.600	0.154	0.019	0.040
73/02/10	14 45		0.540	1.340	0.060	0.012	0.035
73/03/11	10 15		0.750	1.875	0.066	0.015	0.040
73/04/15	13 00		0.357	1.000	0.078	0.009	0.035
73/04/25	14 08		0.850	1.050	0.026	0.011	0.035
73/04/30	08 49		0.240	0.740	0.023	0.005K	0.035
73/05/31	09 05		0.410	1.340	0.094	0.020	0.050
73/06/25	09 09		0.160	0.575	0.046	0.017	0.052
73/07/24	17 16		0.134	0.920	0.020	0.020	0.050
73/08/28	17 02		0.125	0.660	0.056	0.019	0.050
73/09/27	07 47		0.160	0.090	0.034		

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 75/02/04

2629A8 LS2629A8
42 23 00.0 083 54 30.0
HURON RIVER
26 7.5 PINCKNEY
T/FORD LAKE (RESERVOIR)
N TERRITORAL RD BRDG NEAR HUDSON MILLS
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/10/28	10 15		0.045	1.850	0.300	0.068	0.120
72/11/24	09 20		0.168	1.000	0.220	0.040	0.061
72/12/16	14 24		0.210	1.000	0.140	0.023	0.044
73/01/13	13 10		0.460	1.890	0.180	0.015	0.030
73/02/10	14 30		0.420	0.750	0.039	0.006	0.030
73/03/11	11 00		0.378	1.580	0.092	0.007	0.035
73/04/15	13 15		0.231	1.150	0.027	0.005	0.030
73/04/25	14 31		0.350	2.400	0.054	0.005K	0.030
73/04/30	10 07		0.334	0.940	0.011	0.005K	0.040
73/05/31	09 50		0.105	1.800	0.066	0.008	0.020
73/06/26	09 52		0.030	0.820	0.033	0.007	0.025
73/07/24	17 36		0.120	0.920	0.020	0.019	0.055
73/08/28	17 22		0.010	0.810	0.046	0.005K	0.020
73/09/27	07 30		0.030	0.840	0.028	0.010	0.030

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 75/02/04

2629B1 LS2629B1
42 16 00.0 083 40 30.0
SHIFT DRAIN
26 7.5 ANN ARBOR E
T/FORD LAKE (RESERVOIR)
XING NE HURON RIVER DRIVE #US 23
11cPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/10/25	13	10	0.420	1.900	0.150	0.017	0.120
72/11/24	12	00	1.520	2.400	0.070	0.308	0.032
72/12/16	14	41	3.800	2.250	0.285	0.015	0.055
73/01/13	12	50	1.260	3.900	0.280	0.006	0.040
73/02/10	13	27	1.580	0.840	0.027	0.307	0.035
73/03/11	09	15	0.440	4.800	0.357	0.036	
73/04/25	15	14	0.500	1.150	0.027	0.009	0.035
73/04/30	10	44	0.370	0.940	0.022	0.005K	0.035
73/05/31			0.240	3.200	0.168	0.032	0.090
73/07/24	14	16	0.040	1.000	0.115	0.009	0.025
73/08/28	14	12	0.250	2.300	0.094	0.017	0.045
73/09/27	09	10	0.120	0.440	0.073	0.018	0.035

K VALUE KNOWN TO BE
LESS THAN INDICATED

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STORET RETRIEVAL DATE 75/02/04

2624C1 LS2624C1
42 18 30.0 083 48 30.0
HONEY CREEK
26 7.5 ANN ARBOR W
T/FORD LAKE (RESERVOIR)
MILLER RD XING 2 MI NW ANN ARBOR
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/10/28	08 30		0.600	0.850	0.120	0.037	0.025
72/11/24	08 40		2.350	4.700	0.198	0.007	0.021
72/12/16	12 20		1.820	1.200	0.050	0.007	0.028
73/01/13	13 50		1.360	2.520	0.168	0.005K	0.015
73/02/10	15 30		1.220	0.780	0.048	0.005K	0.020
73/04/15	12 15		0.840	0.870	0.044	0.006	0.020
73/04/30	08 37		0.780	0.840	0.023	0.005K	0.020
73/05/31	08 50		0.460	1.150	0.043	0.015	0.040
73/06/26	08 45		0.630	0.690	0.029	0.008	0.035
73/07/24	17 02		0.357	0.840	0.044	0.023	0.045
73/08/28	16 47		0.670	1.100	0.040	0.005K	0.030
73/09/27	08 00		0.960	0.320	0.027	0.008	0.025

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 75/02/04

252901 LS262901
42 20 00.0 083 53 00.0
MILL CREEK
26 7.5 DEXTER
T/P JKD LAKE (RESERVOIR)
ISLAND LK BRDG NW DEXTER ABOVE STP
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/10/28	10 00		0.850	1.200	0.189	0.046	0.105
72/11/24	09 05		3.300	3.000	0.325	0.035	0.082
72/12/16	12 30		3.140	2.100	0.189	0.029	0.072
73/01/13	13 00		1.940	1.400	0.300	0.027	0.070
73/02/10	14 15		1.740	0.705	0.154	0.026	0.065
73/03/11	11 30		1.960	2.400	0.120	0.036	0.085
73/04/15	13 30		1.020	0.950	0.048	0.025	0.070
73/04/25	14 14		2.000	1.200	0.042	0.016	0.050
73/04/30	09 50		0.870	0.840	0.049	0.015	0.060
73/05/31	09 37		0.880	3.100	0.126	0.031	0.082
73/06/26	09 42		0.530	1.050	0.063	0.025	0.095
73/07/24	17 27		0.730	1.400	0.040	0.016	0.025
73/08/28	17 10		0.540	0.840	0.044	0.024	0.075
73/09/27	07 27		0.720	0.980	0.075	0.026	0.060

STORET RETRIEVAL DATE 75/02/04

2624E1 LS2624E1
42 17 30.0 083 44 00.0
UNNAMED STREAM
26 7.5 ANN ARBOR E
T/FORD LAKE (RESERVOIR)
BROADWAY ST BRDG N RIVERVIEW PARK
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/10/28	12 15		0.270	1.100	0.120	0.022	0.058
72/11/24	09 50		1.020	2.000	0.169	0.036	0.063
73/03/11	08 55		0.800	3.200	0.535	0.022	0.120
73/04/25	15 00		0.750	1.100	0.024	0.007	0.030
73/04/30	10 36		0.240	0.830	0.032	0.005K	0.045
73/05/31	10 15		0.320	1.000	0.094	0.020	0.045
73/06/26	10 30		0.168	0.780	0.048	0.025	0.060
73/07/24	18 04		0.530	0.920	0.035	0.025	0.060
73/08/28	17 46		0.017	1.200	0.042	0.012	0.040
73/09/27	08 30		0.130	0.680	0.075	0.013	0.045

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 75/02/04

262950 P0262950 P100000
42 17 30.0 083 44 30.0
ANN ARBOR
26 7.5 ANN ARBOR E.
T/FORD-BELLEVILLE LAKES
HURON RIVER
11EPALES 2141204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50093 CONDUIT FLOW-MGD MONTHLY
73/01/30	00 00								
CP(T)-									
73/01/31	24 00		5.700	13.000	3.700	0.330	1.470	16.300	17.000
73/02/08	00 00								
CP(T)-									
73/02/08	24 00		4.800	11.500	4.620	0.170	0.875	16.100	16.300
73/03/28	00 00								
CP(T)-									
73/03/29	24 00		1.300	13.800	4.600	0.175	0.760	18.000	18.900
73/04/19	00 00								
CP(T)-									
73/04/19	24 00		0.685	18.750	7.650	0.240	0.970	16.400	16.800
73/05/26	00 00								
CP(T)-									
73/05/26	24 00		6.200	4.300	1.370	0.230	0.270	15.900	16.500
73/06/29	00 00								
CP(T)-									
73/06/29	24 00		3.200	9.200	1.380	0.320	1.300	17.000	16.500
73/07/31	00 00								
CP(T)-									
73/07/31	24 00		6.400	4.200	0.140	0.530	1.050	18.400	15.800
73/08/29	00 00								
CP(T)-									
73/08/29	24 00		5.300	6.800	1.860	0.220		15.700	15.500
73/10/11	00 00								
CP(T)-									
73/10/11	24 00		2.730	16.000	8.700	0.240	0.870	15.300	15.200
73/11/02	00 00								
CP(T)-									
73/11/02	24 00		1.540	19.000	8.000	0.245	1.700	15.000	15.000
73/11/27	00 00								
CP(T)-									
73/11/27	24 00		2.000	20.000	3.780	0.530	4.200	17.100	16.400
74/01/08	00 00								
CP(T)-			7.900	7.100	2.760	0.410	0.990	15.500	16.800

STORET RETRIEVAL DATE 75/02/04

262950 P0262950 P100000
42 17 30.0 083 44 30.0
ANN ARBOR
26 7.5 ANN ARBOR E.
T/FORD-BELLEVILLE LAKES
HURON RIVER
11EPALES 2141204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
74/01/29			3.900	12.000	0.170	0.200	0.720	19.400	17.500

STORET RETRIEVAL DATE 75/02/04

262951 PR262951 P001700
42 20 30.0 083 53 30.0
WATER
26 7.5 WATER
T/FORD-BELLEVILLE LAKES
HURON RIVER
TEPALES 2141204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
73/01/30	15 00		0.200	45.000	25.000	4.600	13.000	0.140	0.140
73/02/22	11 00		2.900	39.000	13.200	3.600	8.000	0.150	0.160
73/03/30	15 00		1.100	28.000	9.500	2.600	8.000	0.180	0.200
73/04/30	15 00		0.357	46.000	25.900	3.750	11.000	0.175	0.800
73/05/31	08 00								
CP(T)-			0.405	36.000	15.700	4.830	11.000	0.180	0.180
73/05/31	16 00								
73/06/29	12 30		0.670	24.000	4.200	2.900	8.700	0.200	0.200
73/07/31	15 00		0.130	22.000	9.400	5.200	7.400	0.200	0.190
73/08/30	15 30			22.000	5.400	3.860	8.920	0.160	0.165
73/09/27	14 30		0.460	34.000	13.000	2.520	8.800	0.200	0.200
73/10/31	13 00		0.300	52.000	30.000	5.900	16.500	0.170	0.170
73/11/29	15 00		0.360	37.000	13.000	3.150	9.000	0.200	0.175

STORET RETRIEVAL DATE 75/02/04

262952 TF262952 P000500
42 19 30.0 083 50 30.0
SCIO-WEBSTER
26 7.5 ANN ARBOR W.
I/FORD-BELLEVILLE LAKES
HURON RIVER
11EPALES 2141204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
73/01/15	08 00								
CP(T)-			1.060	13.600	1.950	3.450		0.071	0.088
73/01/15	16 00								
73/02/20	09 00								
CP(T)-			0.910	16.800	4.600	4.400	5.700	0.071	0.070
73/02/20	16 00								
73/03/26	08 00								
CP(T)-			1.150	9.100	0.470	2.800	4.350	0.120	0.094
73/03/26	16 00								
73/04/27	08 00								
CP(T)-			1.100	11.500	0.270	3.000	4.700	0.078	0.090
73/04/27	16 00								
73/05/26	08 00								
CP(T)-			2.600	14.700	1.680	4.400	5.750	0.070	0.085
73/05/26	16 00								
73/07/30	08 00								
CP(T)-			3.000	10.500	0.390	2.600	5.225	0.084	0.076
73/07/30	16 00								
73/08/28	09 00								
CP(T)-			3.150	12.200	1.410	4.040	5.100	0.065	0.071
73/08/28	16 00								
73/11/12	08 00								
CP(T)-			1.850	16.500	4.300	2.200	7.200	0.047	0.053
73/11/12	16 00								
73/12/26	08 00								
CP(T)-			1.150	13.500	1.900	3.400	4.600	0.086	0.079
73/12/26	16 00								
74/01/29	08 00								
CP(T)-			1.040	10.500	0.140	2.160	3.600	0.084	0.076
74/01/29	16 00								
74/02/19	08 00								
CP(T)-			0.760	12.000	1.980	3.480	4.800	0.093	0.085
74/02/19	16 00								
74/03/14	08 00								
CP(T)-			1.600	7.000	0.050	1.750	3.200	0.146	0.125
74/03/14	16 00								

STORET RETRIEVAL DATE 75/02/04

262952 TF262952 P000500
42 19 30.0 083 50 30.0
SCIO-WEBSTER
26 7.5 ANN ARBOR W.
T/FORD-BELLEVILLE LAKES
HURON RIVER
11EPALES 2141204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
74/04/04 CP(T)-	08 00								
74/04/04	16 00		1.240	4.800	0.100	1.300	2.400	0.159	0.150

STORET RETRIEVAL DATE 75/02/04

262953 AS262953 P021000
42 14 00.0 083 36 00.0
YPSILANTI
26 7.5 YPSILANTI E.
T/FORD-BELLEVILLE LAKES
FORD LAKE
HYDRALES 2141204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
73/01/11	00 00								
CP(T)-			0.120	1.100	0.360	2.200		7.660	7.420
73/01/12	24 00								
73/02/06	24 00								
CP(T)-			0.040	6.000	2.200	4.500	5.100	6.600	7.050
73/02/07	24 00								
73/03/04	12 00								
CP(T)-			0.055	6.000	0.720	3.400	3.600	7.300	7.000
73/03/04	12 00								
73/04/12	12 00								
CP(T)-			0.170	7.200	3.100	1.400	3.750	7.220	7.090
73/04/12	24 00								
73/05/09	12 00								
CP(T)-			0.045	3.000	0.190	1.500	1.600	7.050	7.000
73/05/10	12 00								
73/06/12	12 00								
CP(T)-			0.150	6.300	0.540	1.680	2.100	7.620	6.940
73/06/12	24 00								
73/07/10	24 00								
CP(T)-			0.090	6.500	1.400	0.720	1.600	6.880	7.510
73/07/11	24 00								
73/08/10	24 00								
CP(T)-			0.230	8.400	2.500	1.200	2.600	7.680	6.800
73/08/11	24 00								
73/09/12	24 00								
CP(T)-			0.013	9.500	0.720	1.560	2.700	7.550	6.690
73/09/13	24 00								
73/10/08	24 00								
CP(T)-			0.120	13.000	4.100	1.660	3.600	7.620	7.520
73/10/09	24 00								
73/11/06	24 00								
CP(T)-			0.130	10.000	4.300	5.500	6.400	6.700	7.450
73/11/07	24 00								
73/12/05	24 00								
CP(T)-			0.240	3.300	0.100	2.000	2.300	7.050	6.970
73/12/06	24 00								